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WORKING, VOLUNTEERING AND MENTAL HEALTH IN THE LATER YEARS

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Working, Volunteering and Mental Health in the Later Years (*)

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Abstract: This paper examines the effect that working for pay and volunteering has on the mental health of older Irish women and men. Data from four waves of *The Irish Longitudinal Study of Ageing* (TILDA) are used. Three measures that capture different dimensions of mental health are considered. Ordinary least squares regression estimates suggest that both working for pay and volunteering have statistically significant and substantially large positive effects on mental health. However, these effects are less well defined when fixed effects regression is used. The analysis also suggests that combining working for pay with volunteering is more beneficial in terms of mental health than either working for pay or volunteering on their own. That is, there is something "extra" from engaging in both activities. The estimates also suggest a possible trade-off between working for pay and volunteering in terms of mental health benefits. Volunteering may be a "good mental health substitute" for working for pay. The extent of this substitutability is particularly important amongst older people, since participation in paid employment decreases while volunteering increases in older age. Higher levels of volunteering may compensate for the mental health loss associated with lower levels of working for pay. If this is the case, policies that promote volunteering may be cost-effective if they result in higher levels of self-sufficiency amongst older people.

Keys words: mental health, working, volunteering, older people
JEL classification: I12, J14, J22

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Working, Volunteering and Mental Health in the Later Years

1. Introduction

There is little disagreement that population ageing is one of the main economic challenges facing policy-makers in high-income countries. In such countries, life expectancy has increased considerably, with people now being expected to live many years after retirement. In Ireland, for example, the number of people aged 65 and older is projected to almost triple in the next four decades, with currently only around 4.6% of women and 14% of men in this age group being employed (CSO, 2011 and 2013). It is not difficult to understand that the pace of population ageing will place serious financial pressure on the ability of governments to pay state-supplied pensions and other welfare benefits targeted at older individuals.

Another challenge caused by population ageing that receives less attention, is the need to preserve cognition and mental health in older age. It is well-established that cognition declines in the later years. As more people are living into older age, there are also more people living into older age with cognitive impairment (such as dementia). Cognitive impairment makes it more difficult, and eventually for many impossible, to maintain a self-sufficient lifestyle. Mental health problems make it even more difficult to be self-sufficient. Clearly older people who cannot care for themselves need some form of assistance. In most high-income countries, a large part of this assistance is provided by and paid for by the state.

If mental health potentially impacts on self-sufficiency, it is important to understand the determinants of mental health in the older ages. Policies that improve mental health could significantly reduce the economic and social costs of population ageing. There is evidence, based mainly on medical and sociological research, that working benefits mental health, at least amongst people of working age (discussed in the next section). However, there is no

reason to believe that a priori, the mental health benefits of working are not relevant to older individuals.

The purpose of this paper is to examine empirically the impact that working has on the mental health of older Irish women and men. However, unlike previous studies, we consider two types of work. The first is paid employment. The second is non-paid employment or volunteering. We hypothesise that both types of work should have a positive impact on mental health since they have common features. However, we also hypothesise that there is a degree of substitutability between the two types of work. We argue that this substitutability is particularly important since working for pay is lower but volunteering is higher amongst older individuals. As far as we are aware, this is the first paper that investigates and compares the joint impact of working and volunteering on mental health.

The remainder of this paper is organised as follows. Section 2 reviews previous research that has attempted to estimate the impact that working for pay and volunteering on mental health. Section 3 describes the methodology used to estimate the effects of these two activities on the mental health of older Irish women and men. Data from four waves of *The Irish Longitudinal Study of Ageing* (TILDA) are used to fit ordinary least squares and fixed effects regression models of three measures of mental health. Findings are presented in Section 4. The main finding is that both working for pay and volunteering have positive effects on mental health. The analysis also suggests that combining working for pay with volunteering is more beneficial in terms of mental health than either working for pay or volunteering on their own. Conclusions follow in Section 5.

2. Previous Research

The World Health Organization (WHO) has identified five ways in which working benefits mental health (Harnois and Gabriel, 2000). First, it provides structured time. Second,

it provides a source of social contact. Third, it provides satisfaction arising from involvement in a collective effort in a context outside the family. Fourth, it provides a form of social identity. Fifth, it provides regular mental and physical activity. In addition, for most people, working is the principal source of income, which provides the consumption and financial support central to economic well-being.

There is a large body of empirical research that has tested a variety of hypotheses about the relationship between working and mental health. The bulk of this research finds support for the hypothesis that working is beneficial to mental health (Waddell and Burton, 2006). For example, research has consistently found that people who are unemployed, compared to those in employment, score lower on measures of mental health even after other factors that are believed to impact on mental health are held constant. Paul and Moser (2009) carried out an extensive review on the relationship between unemployment and mental health and highlighted at least three key findings. First, the average number of persons with psychological problems among the unemployed is more than double than among employed individuals. Second, men and blue-collar workers appear to be more distressed by unemployment than women and white-collar workers. Third, the longer the unemployment spell, the stronger the negative association with mental health.

This does not, however, mean that working is always beneficial to mental health. There are aspects of working that are believed to have negative consequences for mental health. Research has primarily focussed on the dimension of working relating to "job stress", which has been defined as "the harmful physical and emotional response that occurs when the requirements of the job do not match the capabilities, resources or needs of the worker" (Harnois and Gabriel, 2000, p.6). Some potential causes of work-related stress are overwork, lack of clear instructions, unrealistic deadlines, lack of decision-making, job insecurity, isolated working conditions, surveillance, and inadequate child-care arrangements.

A negative relationship between job stress and mental health has been found in several empirical studies. For example, Wunder and Heineck (2013) found that working time mismatches, which is mismatches between actual and preferred hours of work, is negatively correlated with mental health. Virtanen et al. (2012) examined the association between overtime work and the onset of a major depressive episode in a sample of British civil servants. All respondents were free from psychological morbidity at baseline and were followed for around six years. Virtanen et al. (2012) found that individuals working 11+ hours a day at baseline were significantly more likely to experience a subsequent major depressive episode compared to employees working 7–8 hours a day. Stansfeld and Candy (2006) undertook a meta-analysis of the relationship between psychosocial employment characteristics and mental health using longitudinal studies identified through a systematic literature review. The authors found robust consistent evidence that jobs that combine a high level of effort with low reward (e.g. low pay) and jobs that combine a high level of responsibility with low control are associated with lower mental health.

This research is concerned with working for pay. A smaller literature has investigated the impact that volunteering—working not-for-pay—has on mental health. It has been argued that volunteering has a positive effect on mental health as it promotes social integration and enhances social networks in a manner similar to paid employment. It is believed that volunteering directly provides a social role that gives meaning and purpose in life. Having socially valued roles is likely to enhance identity and self-esteem positively, which provides a sense of worth and status (Nazroo and Matthews, 2012). In their review of the benefits of volunteering, Anderson et al. (2014) conclude that the majority of empirical studies based on descriptive, cross-sectional and longitudinal data reveal that volunteering is associated with reduced symptoms of depression.

There are, however, two empirical issues that complicate the investigation of the relationship between working, volunteering and mental health. The first issue is unobserved heterogeneity, which arises because of the presence of non-measured factors that likely affect both working and volunteering and mental health. Personality is an example of such factors. To illustrate, assume that individuals who have more outgoing personalities are in better mental health and are more likely to volunteer. If personality is unobserved, then volunteering may be spuriously related to mental health. In other words, the relationship may not be "causal". The second empirical issue is the direction of causation. For example, it seems reasonable to conclude that mental health is likely a determinant of labour market decisions made by individuals and firms, suggesting that mental health is likely a factor in both hiring and firing decisions. Likewise, mental health is likely a factor in retirement decisions. And mental health is likely a factor that impacts on the decision to volunteer. This suggests that the decision to work and volunteer is potentially endogenous to mental health, and ideally this should be taken into consideration empirically.

There is a growing literature in economics concerned with the causal effects of job loss and retirement on mental health. The evidence so far suggests that leaving employment has a negative impact on mental health (Sullivan and von Wachter, 2009; Browning and Heinesen, 2012; Marcus, 2013). A large part of this appears to be a cause-effect relationship. The evidence on whether retirement is beneficial or harmful to mental health is, however, less clear (Dave et al., 2008; Bonsang and Klein, 2012; Behncke, 2012, Johnston and Lee, 2009; Eibich, 2015).

To our knowledge, there are only two economics-based studies that have investigated the causal relationship from volunteering activity and mental health. Using data from the *Social Capital Community Benchmark Survey* in the US, Borgonovi (2008) employed instrumental variable estimation and instrumented religious volunteering with a measure of

the level of religious fragmentation in the county where respondents lived. Meier and Stutzer (2008) exploited the longitudinal structure of the *German Socioeconomic Panel* to control for unobserved heterogeneity and then instrumented participation in volunteering activity with the collapse of the German Democratic Republic. Both studies found that volunteering has a strong positive impact on mental health (measured by self-reported happiness/life satisfaction) both before and after controlling for the potential endogeneity of the volunteering. In other words, the dominant causal direction is volunteering on mental health and not mental health on volunteering.

3. Methodology

3.1. Data

The analysis of this paper is based on data from the first four waves of *The Irish Longitudinal Study on Ageing* (TILDA) (Kearney et al., 2011; Whelan and Savva, 2013; Cronin et al., 2013). TILDA is a large-scale, nationally representative study on ageing in Ireland and collects information on all aspects of health, economic and social circumstances from people aged 50 and over in a series of data collection waves once every two years. It is based closely on the *Health and Retirement Study* (HRS), *the English Longitudinal Study on Ageing* (ELSA) and the *Survey of Health, Retirement and Ageing in Europe* (SHARE). TILDA's multidisciplinary and longitudinal design makes it a uniquely powerful resource to study processes in later life.

The first wave of data was collected between October 2009 and July 2011. A total of 8,504 participants were recruited: 8,175 aged 50+ and 329 younger partners of eligible individuals. Respondents first completed a computer-assisted personal interview (CAPI) in their own home. At the end of the CAPI interview, each respondent was asked to fill in a self-completion questionnaire (SCQ) and return it by post (in a prepaid envelope) to the TILDA

study. This questionnaire asked a range of potentially sensitive questions, including questions on quality of life, emotional well-being and health behaviours.

Questions on volunteering activity were also included in the SCQ. The overall response household response rate to the CAPI was 62%. A total of 85% of respondents completing the CAPI also returned the SCQ. The second wave of data was collected between April 2012 and January 2013. An overall response rate of 86% was achieved and 84% of wave 2 respondents returned a SCQ (Dooley et al, 2014). The third wave of data (CAPI interviews) was collected between March 2014 and October 2015. The overall response rate was 85%. The fourth wave of data was collected between January and December 2016[1]. At all four waves, the same questions on volunteering activity were included in the SCQ. The analysis of this paper is based on an unbalanced panel of respondents aged 50+ returning a SCQ at one or more waves. As three measures of mental health are investigated, the sample sizes differ slightly depending on whether the respondents answered the relevant mental health questions at each of the four waves.

3.2. Statistical Model

In order to examine the relationship between mental health, working and volunteering, variants of the following statistical model are estimated:

$$lnMH_{it} = \alpha_1 Work_{it} + \alpha_2 Vol_{it} + \boldsymbol{\beta'X}_{it} + \theta_i + \theta_t + \mu_{it} \quad (1)$$

Where: the subscript "*i*" denotes the individual, $i = 1, 2, \ldots, N$ and the subscript *"t"* denotes the wave, $t = 1, 2, 3$ and *4."lnMH"* is a measure of individual's *"i"* mental health in wave *"t",* expressed in natural logarithms, where higher values denote better mental health;

[1] Wave 4 dataset is a provisional dataset, which may slightly change following finalization.

"*Work*" is a dummy variable coded "1" if the individual is working for pay, either as an employee or a self-employed individual, and coded "0" if not; "*Vol*" is a dummy variable coded "1" if the individual is volunteering and coded "0" if not; and *"**X**"* is a vector of other variables thought to impact on mental health (discussed below). *"θ_i"* is an individual-specific, time-invariant fixed effect*;* *"θ_t"* is a time-specific, individual-invariant fixed effect*;* and *"u_{it}"* is a random error term. The inclusion of individual-specific and time-specific fixed effects helps control for unmeasured factors that affect mental health. α_1, α_2 and $\boldsymbol{\beta}$ are the coefficients to be estimated.

If working and volunteering have a positive impact on mental health, one would expect $\alpha_1 > 0$ and $\alpha_2 > 0$. The magnitudes of these coefficients provide information about the relative importance of each type of work. *If* $\alpha_1 > \alpha_2$, then working for pay is more important than volunteering. On the other hand, if $\alpha_2 > \alpha_1$, then volunteering is more important than working for pay. Finally, *if* $\alpha_1 = \alpha_2$ then working and volunteering have the same importance with respect to their impacts on mental health. Since the mental health measures are transformed into natural logarithms, these coefficients can be easily transformed into percentage effects. More specifically, $\%Work = [\exp(\alpha_1)-1]$ and $\%Vol = [\exp(\alpha_2)-1]$, which makes interpreting the scale of difference between the two effects more intuitive. In addition, these percentage effects are comparable across different regression specifications.

The specification of Equation (1) assumes that the causal direction is from working and volunteering to mental health. However, as was discussed above, it is conceivable that mental health impacts on working or volunteering or both. That is, the causal direction may be the opposite of what is assumed in the above statistical model. In this sense, mental health may be a determinant of working and volunteering. This suggests that both activities are potentially endogenous. If this is the case, then Equation (1) will not likely provide accurate

estimates of the effect of working and volunteering on mental health even after the inclusion of individual- and time-specific fixed effects.

This issue of reverse causation could be addressed through the use of Instrumental Variables (IV) estimation. However, to apply this strategy one would need two so-called instrumental variables. The first variable of these would need to be highly correlated with working for pay but not correlated with volunteering or mental health. The second variable would need to be highly correlated with volunteering but not correlated with working for pay or mental health. It is difficult to think of two variables that meet such criteria, and there are certainly no variables in TILDA that do so. Therefore, in this paper the issue of two-way causation is not explored empirically. We believe this may not be a serious problem if we restrict the discussion to the relative sizes of the effect of working and volunteering on mental health. This is analogous to assuming that the confounding effects of endogeneity impact equally on both activities.

3.3. Variables

3.3.1 Mental Health

Mental health is a multidimensional concept. Three key dimensions of mental health are: (1) depressive symptoms; (2) quality of life perceptions; and (3) loneliness feelings. In the analysis in the paper, well-established measures of depressive symptoms, quality of life and loneliness feelings are used. Depressive symptoms are measured using the abbreviated eight item version of the "Centre for Epidemiological Studies-Depression scale" (*CESD*) (Radloff, 1977). This test consists of questions relating to negative feelings (like feeling lonely or sad), positive thoughts (as feeling happy, enjoying life), somatic activity (like suffering from a restless sleep) and social contacts (interaction with people). Examples of questions/statements included in the measures are: "*I feel that everything I do is an effort*"

and "*I cannot get going*". Each of the eight items is measured on a four-point scale leading to a total score ranging from 0 to 24, with higher scores indicating more depressive symptoms.

Quality of life is measured using a 12 item scale specifically developed for use with older people (Hyde et al., 2003). This measure captures dimensions of "Control, Autonomy, Self-realisation and Pleasure" (*CASP*). Examples of questions/statements included in the measures are: "*I feel what happens to me is out of my control*"; "*Shortage of money stops me from doing the things I want to do*"; "*I feel my life has a meaning*"; and "*I feel satisfied with the way my life has turned out*". Each item is measured on a four-point scale leading to a total score ranging from 0 to 36, with higher scores indicating better quality of life.

Loneliness is measured using a modified version of the "University of California Los Angeles Loneliness Scale" (*UCLALon)* (Russell, 1996). Four negatively worded and one positively worded questions are used. The questions used include: "*How often do you feel a lack of companionship*?"; "*How often do you feel left out?";* and; "*How often do you feel in tune with the people around you?*". Each of the 5 items is measured on a three-point scale leading to a total score ranging from 0 to 10, with higher scores indicating greater loneliness feelings. (The complete list of items included in the three measures is included as Appendix 1).

3.3.2 Working and Volunteering

The information on work for pay and volunteering collected in TILDA allows several ways of measuring both variables for the analysis. The first, as described in Equation (1) above, is with two dummy variables. The first variable is whether the respondent is working for pay or not (*Work*). All TILDA respondents are asked to report their current labour market status. They are coded as "working for pay" if they report to be employed or self-employed or to have done at least one hour of paid work in the week prior to the interview. They are coded as "not working for pay" if they report to be retired, unemployed; permanently sick or

disabled; looking after home or family; in education or training; and other. The second variable is whether the respondent is volunteering or not (*Vol*). Respondents are coded as volunteering if they report engaging in volunteering activities frequently, which is at least once per week.

Second, it is possible that respondents combine working for pay and volunteering. It could be the case that the effect of working and volunteering is not simply additive, as assumed by only including dummy variables for each type of activity. In order to capture what is effectively the interaction between the two activities, three dummy variables are created. The first variable is a dummy, "*WorkOnly*", coded "1" if the respondent is only working for pay and coded "0" otherwise (i.e. not volunteering). The second variable is a dummy, "*VolOnly*", coded "1" if the respondent is only volunteering and coded "0" otherwise (i.e. not working for pay). The third variable is a dummy, "*Both*", coded "1" if the respondent is working for pay and volunteering and coded "0" otherwise. With this variable specification, the reference group is neither working for pay nor volunteering.

Third, it seems reasonable to hypothesize that the frequency of working for pay and the frequency of volunteering likely impact on mental health. In order to explore this, two continuous variables are created: "*DaysWork*" and "*DaysVol*". At each wave, respondents who are in paid employment are asked to report the number of hours they spend in employment in a typical week, excluding meal breaks but including any paid or unpaid overtime. We code number of days spent in employment in a typical week "*DaysWork"* as: 1 for respondents who work 1 to 8 hours per week; 2 for respondents who work 9 to 16 hours per week; 3 for respondents who work 17 to 24 hours per week; 4 for respondents who work 25 to 32 hours per week; 5 for respondents who work 33 to 40 hours per week; 6 for respondents who work 41 to 48 hours per week and 7 for respondents working 49 or more hours per week. Respondents who do not engage into paid employment are coded as 0. As the

question on number of hours spent in employment in a typical week is not asked to self-employed individuals in TILDA, the self-employed have to be excluded from this part of the analysis.

At each wave, respondents are asked about their participation in volunteering activity through the question "How often, if at all, do you do voluntary activity?" The frequency of participation is assessed as: never; less than once a year; about once or twice a year; every few months; about once a month; twice a month or more; once a week or more; daily/almost daily. We code number of days engaging into volunteering activity in a typical week "*DaysVol"* as: 0 for respondents who never volunteer; 0.04 for respondents who volunteer less than once per year; 0.08 for respondents who volunteer once or twice per year; 0.17 for respondents who volunteer every few months; 0.25 for respondents who volunteer once per month; 0.5 for respondents who volunteer twice per month; 1 for respondents who volunteer once per week and 7 for respondents who volunteer daily or almost daily. The logic behind this calculation is as follows. As there are 52 weeks in a year, someone who volunteers once per week, volunteers 52 times per year or 1 day per week. Someone who volunteers twice per month, volunteers 26 times per year or 0.5 days per week. Someone who volunteers about once per month, volunteers 13 times per year or 0.25 days per week. The same reasoning applies to the other frequency groups.

3.3.3 Control Variables

In addition to the working for pay and volunteering variables, a set of control variables are included. These include age (and age-squared), education and marital status. Marital status (*MarCoh*) is coded as 1 for respondents who are married or cohabiting; 0 otherwise. Age, education and marital status are thought to be important determinants of mental health. In addition, variables aimed at capturing childhood socioeconomic circumstances are also included. There is considerable interest in the relationship between

early-life circumstances and later-life mental health, partly because such circumstances are clearly exogenous.

The relationship between education and mental health in later life has been studied extensively in the medical literature. Evidence that education and mental health in old age are positively associated has been found in a number of studies, including Luo and Waite, 2005; Brandt et al., 2012; and Kendig et al., 2016. Since most schooling amongst older Irish adults is completed when they are young, and before they enter the labour market, it is exogenous. In the analysis, education, "*School*", is measured in years of schooling completed.

Several childhood characteristics have been shown to be associated with mental health in later-life (Luo and Waite, 2005; Brandt et al., 2012; and Kendig et al., 2016). A set of dummy variables based on respondent's self-reporting of childhood conditions before the age of 14 are included in the analysis. They are: *PoorHealth*=1 if the respondent was in "fair/poor health" (0=otherwise); *PoorFam*=1 if respondent "grew up in a poor family" (0=otherwise); *MotherNotWork*=1 if respondent's "mother never worked outside the home" (0=otherwise); and *FatherNotWork*=1 if respondent's "father never worked outside the home" (0=otherwise).

4. Results

4.1 Descriptive Statistics

Means and standard deviations of the variables included in the regressions are shown in Table 1. In order to make interpretation easier, the scores of the mental health variables *CESD* and *UCLALon*, have been transposed. Now, higher values for all three mental health variables imply better mental health. The samples sizes for each of the mental variables vary slightly depending on the extent of missing information. However, with respect to working for pay, volunteering and the control variables, there are no significant differences across the

three samples. Upwards of one-third (c. 37%) of the respondents report working for pay and around 18% report volunteering at least once per week. Around one-half of respondents neither work nor volunteer. Around 30% of respondents report "working only" while 12% report "volunteering only". Around 6% report doing both, suggesting that working and volunteering are not mutually exclusive activities amongst older Irish men and women. On average, the respondents in the sample work for 1.4 days per week and volunteer for 0.5 days per week. Although these frequencies might seem small at first, one needs to remember that the sample also includes individuals who do not work and do not volunteer.

<<<< Table 1 About Here >>>>

With respect to the control variables, the average age is about 66 years, which is the age perceived to be the "normal" age of retirement in Ireland. About 46% of respondents are male, which is what is expected given the higher mortality amongst men compared to women. The average number of years of schooling is 12 years, which corresponds approximately to finishing secondary school. Around 6% of respondents report poor health when they were children. Around 20% report growing up in poor household. Around 70% remember their mothers not working when they were children. The share for fathers not working is much lower, around 6.5%.

Table 2 investigates whether there are differences in terms of mental health depending on whether respondents are working for pay or not and whether they are volunteering or not. With respect to working or not, across all three mental health variables, those who work have better mental health. This difference is highly statistically significant ($p < 0.01$). In percentage terms, the mental health advantage of working is around 4-6% depending on which of the three mental health measures is being considered. With respect to volunteering, across all the mental health variables, those who volunteer have better mental health. Again this difference is highly statistically significant ($p < 0.01$). In percentage terms, the mental

health advantage of volunteering is around 2-5%. Despite being small in percentage terms, we believe that these differences are substantially significant since they are observed before controlling for other factors thought to impact on mental health.

<<<< Table 2 About Here >>>>

Figure 1 shows the mean values of *CESD*, *CASP* and *UCLALon* by employment status (i.e. working and not working for pay) broken down by age. For all three of the mental health measures, and for each age group, mental health is better for those who work for pay compared to those who do not. In addition, the figure suggests that the relationship between mental health and age is non-linear, improving then declining, with the maximum reaching in the mid-to-late 60's. Figure 2 shows the mean values by volunteering status (i.e. volunteering and not volunteering) broken down by age. The pattern is very similar to what is observed for employment status. For all three of the mental health measures, and for each age group, mental health is better for those who volunteer compared to those who do not. The figures also confirms the non-linear relationship between mental health and age.

<<<< Figures 1 and 2 About Here >>>>

4.2. Findings

Before presenting the regression results, it is important to note that all three mental health measures have been transformed. For *CASP*, 1-point is added to each individual's score and then the natural logarithm is taken. For *CESD* and *UCLALon*, 1-point is added to each individual's score and then the natural logarithm is taken, which is then multiplied by -1. Therefore, a higher value of all three transformed variables suggests better mental health, which is fewer depressive symptoms, greater quality of life and fewer loneliness feelings. This makes interpretation of the estimates more intuitive. Since the mental health measures

are heavily skewed, taking the natural logarithm helps normalise the distribution, resulting in a variable more suited to regression analysis.

Table 3 reports the regression estimates for what can be considered to be a baseline specification. In this specification only the "work or not" variable (*Work*) and the control variables are included. As discussed above, this specification is consistent with the majority of the research to date that has attempted to assess the impact or working for pay on mental health. Columns (1)-(2) are for *CESD*; Columns (3)-(4) are for *CASP*; and Columns (5)-(6) are for *UCLALon*. Columns (1), (3) and (5) are ordinary least squares (OLS) estimates. Columns (2), (4) and (6) are fixed effects (FE) estimates. The rest of the tables of results in the section are organised in a similar manner. Panel (A) of Table 4 reports the coefficients of the *Work* variable transformed into percentage effects.

<<<< Tables 3 and 4 About Here >>>>

Turning first to the OLS estimates, for all three measures, the coefficient of *Work* is positive and highly statistically significant ($p < 0.01$). However, the FE estimates suggest that, while the coefficient of *Work* is positive for two of the three mental health variables (*CASP* and *UCLALon)*, the coefficient is not statistically significant at conventional threshold levels (i.e. $p < 0.1$). In addition, for *CESD* the coefficient of *Work* is much smaller when fixed effects are included. This is also shown in Panel (A) of Table 4. The percentage effects of *Work* based on OLS are 23.2%, 6.9% and 11.9% for *CESD*, *CASP* and *UCLALon*, respectively. Based on FE, the percentage effects are much smaller, 5.7% for *CESD* and effectively zero for *CASP* (0.6%) and *UCLALon* (0.9%).

The regressions of Table 3 include two control variables that vary over time: marital status (*MarCoh*) and age. Focusing first on *MarCoh*, the coefficient of *MarCoh* is positive and statistically significant in the OLS regressions of Columns (1), (3) and (5). This means that individuals who are married or cohabiting are in better mental health. The coefficient of

MarCoh remains statistically significant, positive and large in magnitude in the FE regressions that estimate *CESD* and *UCLALon*. However, it becomes negative and statistically insignificant in the FE regression that estimates quality of life (*CASP).* While initially surprising, this may reflect the fact that respondents who experienced widowhood between waves had a lower quality of life at baseline because their spouse/partner was in poor health prior to their death. Turning then to Age, the findings of Figure 1 and 2 are confirmed: the relationship between mental health and age is non-linear, as mental health first improves and then declines with age.

As a group, the remaining time-invariant variables included in the OLS regressions should proxy well the socio-economic conditions in the childhood home. As mentioned above, there is research that suggests that early-life conditions impacts on mental health in later-life. Strong support for this hypothesis is found for the variables *PoorHealth* and *PoorFam*. Respondents who report they were in fair/poor health in childhood and who grew up in a poor family are in poorer mental health. The coefficients of *PoorHealth* and *PoorFam* are negative and statistically significant at the 1% level for all mental health variables. The magnitude of these associations are sizeable. Reporting poor health in childhood is associated with 29.2% higher depressive symptoms in later life. Likewise, quality of life is around 7.3% lower and loneliness feelings are 11.7% higher. However, the reasons behind poor childhood health can be caused by socio-economic conditions but also by factors largely independent of socio-economic conditions (such as contagious disease). Interestingly, having a mother who did not work is associated with better mental health in later life. The coefficient of *School* is positive and statistically significant at the 1% level for all three measures of mental health. More schooling is associated with better mental health. The estimates suggest that an additional year of schooling is associated with a 1.5% improvement in *CESD;* a 0.7% improvement in *CASP;* and a 1.4% improvement in *UCLALon.*

Table 5 reports the regression estimates for *CESD*, *CASP* and *UCLALon* that include the both *Work* and *Vol*. Turning first to the OLS estimates, for all three measures, the coefficients of *Work* and *Vol* are positive and highly statistically significant ($p < 0.01$). Panel (B) of Table 4 reports the coefficients of the *Work* and *Vol* transformed into percentage effects. Both working for pay and volunteering are associated with better mental health, holding constant other factors that are thought to affect mental health. Furthermore these effects are not small, suggesting that both working for pay and volunteering have a sizeable positive impact on mental health. The percentage effects of *Work* and *Vol* are 23.7% and 15.3% for *CESD;* 7.0% and 5.0% for *CASP* and 12.3% and 12.9% for *UCLALon*. It is interesting to note that the percentage effects for *Work* in this specification are very similar to the effects based on the specification that only includes *Work* [i.e. Panel (A) in Table 4].

<<<< Tables 5 about About Here >>>>

The FE estimates are less clear cut. With respect to *CESD*, the coefficients of both *Work* and *Vol* are positive and highly statistically significant. However, the percentage effects are much smaller, 6.0% for *Work* and 6.3% for *Vol.* For *CASP* and *UCLALon, Work* is not statistically significant. For these two mental health measures, the coefficient of *Vol* remains positive and highly statistically significant ($p < 0.01$). However, the percentage effects are much smaller, 1.1% for *CASP* and 4.5% for *UCLALon.* These estimates reduce the confidence that we can attach to the view that working for pay and volunteering both have a positive impact on mental health.

Table 6 reports the regression estimates for *CESD*, *CASP* and *UCLALon*, that include the *WorkOnly, VolOnly* and *Both* variables. These variables distinguish those who only work or pay, only volunteer, work for pay and volunteer and do neither (the excluded category). Panel (C) of Table 4 reports the coefficients of the variables transformed into percentage effects. Turning first to the OLS estimates, for the three mental health measures, the

coefficients of *WorkOnly, VolOnly* and *Both* are all positive and highly statistically significant. However, the percentage effect is largest for *Both*. For those who combine working for pay and volunteering, the percentage effects are large: 36.5% for *CESD*; 10.8% for *CASP;* and 22.0% for *UCLALon*. The percentage effects for only working for pay are much smaller: 19.0% for *CESD*; 6.0% for *CASP* and 16.0% for *UCLALon*. Likewise, the percentage effects for only volunteering are also much smaller: 25.7% for *CESD*; 7.6% for *CASP* and 13.9% for *UCLALon.* The estimates suggest that there is an additional mental health benefit of combing working for pay and volunteering compared to only doing one or the other.

<<<< Table 6 About Here >>>>

For all three mental health measures, the FE coefficients for *WorkOnly, VolOnly* and *Both* remain positive. *Both* is highly statistically significant for all three mental health measures. The percentage effects for *Both* are smaller than for OLS: 10.7% for *CESD*; 1.9% for *CASP* and 6.2% for *UCLALon*. *WorkOnly* is also statistically significant ($p < 0.05$) for all three mental health measures. The percentage effects are also smaller than for OLS: 7.6% for *CESD*; 1.0% for *CASP* and 4.1% for *UCLALon*. The coefficient of *VolOnly* is only statistically significant for *CESD*, with a percentage effect of 6.7%. For the other two mental health measures, *CASP* and *UCLALon*, the percentage effects of *VolOnly* are effectively zero.

The regression estimates reported above provide some evidence that both working for pay and volunteering have a positive impact on mental health. However, the differences between the OLS and FE estimates suggest (amongst other possibilities) that our chosen empirical specification is not capturing the complexity of this relationship. One potential shortcoming is that these variables do not capture differences in the amounts of working for pay and volunteering. As discussed above, two variables were constructed that measure the number of days of work per week (*DaysWork*) and number of days of volunteering per week

(*DaysVol*). You would expect that the mental health effects of working for pay and volunteering would depend on how much of each activity an individual is doing.

<<<< Table 7 About Here >>>>

The regression estimates based on this specification are shown in Table 7. The percentage effects are shown in Panel (D) of Table 4. For all three mental health measures, the coefficients for *Days Work* and *DaysVol* are positive. The OLS estimates of these coefficients are highly statistically significant ($p < 0.01$). The percentage effects for the two activities are similar in magnitude. More specifically, percentage effects for *DaysWork* and *DaysVol* are *4.9%* and *3.1% for CESD;* 1.4% and 1.0% *for CASP;* and 2.2% and 2.2% for *UCLALon.* An F-test indicated that the difference between these two effects is statistically significant for *CESD* and *CASP*, suggesting that working for pay has a larger positive effect on mental health compared to volunteering. However, this is not the case for *UCLALon,* where the effect of both activities is similar. The percentage effects are considerably smaller when FE estimation is used. For U*CLALon*, both *DaysWork* and *DaysVol* are not statistically significant, suggesting that neither working for pay nor volunteering has much effect on loneliness feelings. For *CASP*, *DaysWork* is not statistically significant but *DaysVol* is statistically significant. For *CESD*, the percentage effects of *DaysWork* and *DaysVol* are statistically significant but only at the $p < 0.1$ and $p < 0.05$ levels, respectively. Plus an F-test indicated that percentage effects are not different for the two types of activities. It is also important to note that regressions were estimated (not reported) that included an interaction between *DaysWork* and *DaysVol*. This interaction was never statistically significant.

In summary, the OLS estimates lend considerable support to the view that both working for pay and volunteering have a sizeable positive effect on mental health. OLS estimates show that the more work for pay and the more volunteering, the larger the mental health benefit. The FE estimates are less well defined. Fixed effects estimation is a way for

controlling for time-invariant unobserved differences that impact the outcome of interest. However, fixed effects estimation is not without pitfalls. To illustrate, assume that respondents with more "outgoing personalities" are more likely to work and/or volunteer. The panel structure of the TILDA data allows for the control of such factors assuming they do not change over time. A disadvantage of this approach, however, is that one loses the positive effect of working and/or volunteering on mental health for those who benefit the most and therefore always work and/or volunteer. Their mental health is never observed in the panel dataset in the alternative state of not working or not volunteering. Therefore, their mental health differences resulting from difference in working and volunteering cannot be identified with fixed-effects estimation. Put differently, fixed-effect estimation is more restrictive as it is based on variation over time within individuals. Not surprisingly, fixed effects estimates are expected to be smaller compared to OLS estimates. Most importantly, it does not mean that the fixed effects estimates are in any way preferred estimates.

5. Conclusions

This paper has examined the effect that working for pay and volunteering has on the mental health of older Irish women and men. Three key dimensions of mental health are explored: (1) depressive symptoms; (2) quality of life perceptions; and (3) loneliness feelings. It is found that working for pay is a factor that contributes to better mental health. It is also found that volunteering contributes to better mental health. OLS regression estimates suggest that these effects are statistically significant and substantially large. These effects are less well defined when fixed effects regression is used. However, these effects have always positive sign. In other words, we find no evidence that working for pay or volunteering (or doing both) has a negative effect on mental health.

We view these findings as encouraging as they suggest a possible trade-off between working for pay and volunteering. It is well known that participation in paid employment decreases while volunteering increases in the older ages. Higher levels of volunteering may compensate for the mental health lost associated with lower levels of employment for pay. That is, volunteering may be a "good substitute" for working for pay. If this is the case, policies that promote volunteering may be very cost-effective if they result in higher levels of self-sufficiency amongst older people.

A key (and novel) finding of this paper is that combining working for pay with volunteering is considerably more beneficial in terms of mental health than either working for pay or volunteering on their own. The effect of combining these two activities remains positive and statistically significant at the 1% level when fixed effects regression is used. This suggests that the relationship between working and volunteering and mental health is not explained - at least not fully - by time-invariant unobservable factors that are also correlated with mental health.

Combining working and volunteering is beneficial to different aspects of mental health. Our analysis suggests that this combination leads to lower depressive symptoms, higher quality of life and lower loneliness feelings. Depressive symptoms such as sleep problems, fatigue, and low energy levels are common, under-recognised and often inappropriately treated in older adults (Mojtabai, 2014). Quality of life measures different domains including the ability to actively participate in one's environment and the sense of happiness or enjoyment derived from engaging with life (Sexton et al., 2013). Loneliness pertains "to the feeling of missing intimate relationships or missing a wider network", and is therefore "an individual's subjective evaluation of one's social participation or isolation" (de Jong and Havens, 2004).

More research with alternative measures of mental health is needed in order to understand better how working for pay and volunteering impact on the various dimensions of mental health. Likewise, more research is needed to understand how the amount of work for pay (e.g. hours per week working) and the amount of volunteering (e.g. hours per week volunteering) impact on mental health. Our analysis suggests that that more work for pay and more volunteering lead to better mental health. However, our simple specification unlikely captures well the complexity of this relationship. “More” may not necessary be “better” in this respect. We know that time is a fixed resource, so more work for pay and/or more volunteering means less time for other activities that could also have a positive mental health benefit. In other words, much more detailed information about how older people spend their time needs to be collected than is typically collected in ageing studies such as TILDA.

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Table 1
Descriptive Statistics
Mean and (Standard Deviations)

	(1)	(2)	(3)
Mental Health variables:	*CESD*	*CASP*	*UCLALon*
	21.1 (3.7)	27.5 (5.3)	8.2 (2.1)
Working for Pay and Volunteering variables:			
Work	36.4%	37.3%	36.5%
Vol	17.9%	17.9%	17.9%
WorkOnly	30.5%	31.2%	30.6%
VolOnly	12.0%	11.8%	11.9%
Both (work and vol)	5.9%	6.1%	6.0%
Neither (work or vol)	51.6%	50.9%	51.5%
DaysWork	1.4	1.4	1.4
DaysVol	0.5	0.5	0.5
Control variables:			
MarCoh	71.5%	71.9%	71.5%
Age	65.8 (9.1)	65.5 (9.0)	65.7 (9.1)
Male	45.8%	46.4%	45.8%
School	12.0 (2.9)	12.1 (2.9)	12.0 (2.9)
PoorHealth	6.1%	6.0%	6.1%
PoorFam	19.6%	19.5%	19.6%
MotherNoWork	70.4%	70.4%	70.4%
FatherNoWork	6.5%	6.4%	6.5%
N	21,034	19,566	20,761

Notes: CESD and *UCLALon* have been transformed so higher values indicate better mental health

Table 2
Mental Health Variables Broken-down by
Employment and Volunteering Status

	(1)	(2)	(3)
Mental Health variable:	*CESD*	*CASP*	*UCLALon*
Working for pay?			
Yes	21.6	28.4	8.4
No	20.8	26.9	8.1
% Difference (Yes-No)	3.8%	5.6%	3.7%
Volunteering?			
Yes	21.5	28.6	8.5
No	21.0	27.2	8.1
% Difference (Yes-No)	2.4%	5.1%	4.9%
N	21,034	19,566	20,761

Notes: CESD and *UCLALon* have been transformed so higher values indicate better mental health
All the differences are statistically significant at *** $p < 0.01$

Table 3
Mental Health Regression Estimates for *"Work"* Specification

	(1)	(2)	(3)	(4)	(5)	(6)
Estimator	**OLS**	**FE**	**OLS**	**FE**	**OLS**	**FE**
	-ln(CESD)	*-ln(CESD)*	*ln(CASP)*	*ln(CASP)*	*-ln(UCLALon)*	*-ln(UCLALon)*
Work	0.209***	0.0556***	0.0664***	0.00572	0.116***	0.00900
	(14.8)	(2.9)	(18.2)	(1.4)	(9.9)	(0.6)
MarCoh	0.223***	0.369***	0.0430***	-0.00378	0.370***	0.346***
	(16.9)	(9.0)	(12.5)	(-0.4)	(33.6)	(11.8)
Age	0.0629***	0.0776***	0.0337***	0.0293***	0.0400***	0.0388***
	(7.5)	(4.5)	(15.4)	(7.9)	(5.7)	(3.1)
Age^2	-0.000407***	-0.000543***	-0.000235***	-0.000226***	-0.000247***	-0.000356***
	(-6.7)	(-5.2)	(-14.7)	(-10.1)	(-4.8)	(-4.7)
Male	0.177***	--	-0.0176***	--	0.0181*	--
	(15.0)		(-5.7)		(1.8)	
School	0.0151***	--	0.00677***	--	0.0139***	--
	(7.3)		(12.6)		(8.0)	
PoorHealth	-0.256***	--	-0.0704***	--	-0.111***	--
	(-10.6)		(-11.2)		(-5.5)	
PoorFam	-0.0836***	--	-0.0304***	--	-0.0862***	--
	(-5.5)		(-7.7)		(-6.9)	
MotherNoWork	0.0412***	--	0.0160***	--	0.0462***	--
	(3.2)		(4.8)		(4.4)	
FatherNoWork	0.0526**	--	-0.000144	--	-0.0458**	--
	(2.2)		(-0.02)		(-2.3)	
Wave 2	0.0243	0.0185	-0.0393***	-0.0362***	-0.0137	0.00867
	(1.5)	(0.8)	(-9.7)	(-7.0)	(-1.0)	(0.5)
Wave 3	-0.125***	-0.131***	-0.0525***	-0.0487***	0.0529***	0.101***
	(-7.6)	(-2.6)	(-12.2)	(-4.4)	(3.8)	(2.7)
Wave 4	-0.139***	-0.152**	-0.0300***	-0.0292**	0.0530***	0.115**
	(-8.1)	(-2.3)	(-6.7)	(-2.0)	(3.7)	(2.3)
Constant	-3.779***	-3.929***	2.047***	2.427***	-2.840***	-2.048***
	(-13.2)	(-5.1)	(27.4)	(14.5)	(-11.9)	(-3.6)
N	21,034	21,034	19,566	19,566	20,761	20,761
R-sq(%)	6.0%	2.4%	6.6%	3.6%	8.0%	1.7%

Notes: For all dependent variables, higher values indicate better mental health.
t statistics in parentheses: * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$

Table 4
Estimated Percentage Impacts of Working and Volunteering based on Regression Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Estimator	**OLS**	**FE**	**OLS**	**FE**	**OLS**	**FE**
	-ln(CESD)	*-ln(CESD)*	*ln(CASP)*	*ln(CASP)*	*-ln(UCLALon)*	*-ln(UCLALon)*
Panel A (Table 3):						
Work	23.2%***	5.7%***	6.9%***	0.6%	11.9%***	0.9%
Panel B (Table 5):						
Work	23.7%***	6.0%***	7.0%***	0.6%	12.3%***	1.1%
Vol	15.3%***	6.3%***	5.0%***	1.1%***	12.9%***	4.5%***
Panel C (Table 6):						
WorkOnly	19.0%***	7.6%***	6.0%***	1.0%**	16.0%***	4.1%**
VolOnly	25.7%***	6.7%***	7.6%***	0.6%	13.9%***	0.9%
Both	36.5%***	10.7%***	10.8%***	1.9%***	22.0%***	6.2%***
Panel D (Table 7):						
DaysWork	4.9%***	0.8%*	1.4%***	0.1%	2.2%***	<0.1%
DaysVol	3.1%***	1.2%**	1.0%***	0.3%**	2.2%***	0.5%

Notes*:* For all dependent variables, higher values indicate better mental health
%Impact(x) = [exp(β)-1] x 100, where β is the relevant regression coefficient
Statistical significance levels are: * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$

Table 5
Mental Health Regression Estimates for *"Work"* and *"Vol"* Specification

	(1)	(2)	(3)	(4)	(5)	(6)
Estimator	**OLS**	**FE**	**OLS**	**FE**	**OLS**	**FE**
	-ln(CESD)	*-ln(CESD)*	*ln(CASP)*	*ln(CASP)*	*-ln(UCLALon)*	*-ln(UCLALon)*
Work	0.213***	0.0583***	0.0678***	0.00627	0.116***	0.0111
	(15.1)	(3.0)	(18.7)	(1.6)	(9.9)	(0.8)
Vol	0.142***	0.0607***	0.0485***	0.0109***	0.121***	0.0441***
	(9.4)	(3.3)	(12.4)	(2.8)	(9.6)	(3.3)
MarCoh	0.224***	0.369***	0.0432***	-0.00373	0.370***	0.346***
	(17.0)	(9.1)	(12.6)	(-0.4)	(33.6)	(11.8)
Age	0.0586***	0.0764***	0.0322***	0.0291***	0.0400***	0.0378***
	(7.0)	(4.5)	(14.7)	(7.9)	(5.7)	(3.0)
Age^2	-0.000375***	-0.000530***	-0.000224***	-0.000224***	-0.000247***	-0.000347***
	(-6.2)	(-5.1)	(-14.0)	(-10.0)	(-4.8)	(-4.6)
Male	0.179***	--	-0.0170***	--	0.0181*	--
	(15.2)		(-5.6)		(1.8)	
School	0.0131***	--	0.00611***	--	0.0139***	--
	(6.3)		(11.4)		(8.0)	
PoorHealth	-0.253***	--	-0.0695***	--	-0.111***	--
	(-10.5)		(-11.1)		(-5.5)	
PoorFam	-0.0889***	--	-0.0323***	--	-0.0862***	--
	(-5.9)		(-8.2)		(-6.9)	
MotherNoWork	0.0399***	--	0.0155***	--	0.0462***	--
	(3.1)		(4.7)		(4.4)	
FatherNoWork	0.0513**	--	-0.000632	--	-0.0458**	--
	(2.2)		(-0.1)		(-2.3)	
Wave 2	0.0229	0.0170	-0.0399***	-0.0365***	-0.0137	0.00767
	(1.5)	(0.7)	(-9.9)	(-7.1)	(-1.0)	(0.4)
Wave 3	-0.126***	-0.133***	-0.0530***	-0.0492***	0.0529***	0.0992***
	(-7.7)	(-2.7)	(-12.4)	(-4.4)	(3.8)	(2.6)
Wave 4	-0.139***	-0.155**	-0.0301***	-0.0298**	0.0530***	0.113**
	(-8.1)	(-2.4)	(-6.7)	(-2.0)	(3.7)	(2.3)
Constant	-3.638***	-3.918***	2.097***	2.428***	-2.840***	-2.036***
	(-12.7)	(-5.1)	(28.1)	(14.5)	(-11.9)	(-3.6)
N	21,034	21,034	19,566	19,566	20,761	20,761
R-sq(%)	6.4%	2.5%	7.3%	3.7%	8.0%	1.8%

Notes: For all dependent variables, higher values indicate better mental health
t statistics in parentheses: * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$

Table 6
Mental Health Regression Estimates for "*WorkOnly*", "*VolOnly*" and "*Both*" Specification

	(1)	(2)	(3)	(4)	(5)	(6)
Estimator	**OLS**	**FE**	**OLS**	**FE**	**OLS**	**FE**
	-ln(CESD)	*-ln(CESD)*	*ln(CASP)*	*ln(CASP)*	*-ln(UCLALon)*	*-ln(UCLALon)*
WorkOnly	0.174***	0.0728***	0.0584***	0.00951**	0.148***	0.0402**
	(9.4)	(3.3)	(12.1)	(2.1)	(9.6)	(2.5)
VolOnly	0.229***	0.0648***	0.0728***	0.00557	0.130***	0.00900
	(15.1)	(3.2)	(18.7)	(1.3)	(10.3)	(0.6)
Both	0.311***	0.102***	0.103***	0.0190***	0.199***	0.0606***
	(12.0)	(3.2)	(15.4)	(2.9)	(9.2)	(2.6)
MarCoh	0.224***	0.369***	0.0433***	-0.00373	0.370***	0.346***
	(17.0)	(9.1)	(12.6)	(-0.4)	(33.6)	(11.8)
Age	0.0582***	0.0760***	0.0321***	0.0291***	0.0397***	0.0380***
	(7.0)	(4.4)	(14.6)	(7.9)	(5.7)	(3.0)
Age^2	-0.000372***	-0.000528***	-0.000223***	-0.000224***	-0.000244***	-0.000347***
	(-6.1)	(-5.0)	(-14.0)	(-10.0)	(-4.8)	(-4.6)
Male	0.178***	--	-0.0171***	--	0.0180*	--
	(15.1)		(-5.6)		(1.8)	
School	0.0131***	--	0.00611***	--	0.0139***	--
	(6.3)		(11.4)		(8.0)	
PoorHealth	-0.253***	--	-0.0695***	--	-0.111***	--
	(-10.5)		(-11.1)		(-5.5)	
PoorFam	-0.0884***	--	-0.0321***	--	-0.0858***	--
	(-5.9)		(-8.2)		(-6.8)	
MotherNoWork	0.0397***	--	0.0155***	--	0.0460***	--
	(3.1)		(4.7)		(4.3)	
FatherNoWork	0.0515**	--	-0.000543	--	-0.0455**	--
	(2.2)		(-0.09)		(-2.3)	
Wave2	0.0224	0.0172	-0.0400***	-0.0365***	-0.0141	0.00766
	(1.4)	(0.7)	(-9.9)	(-7.1)	(-1.1)	(0.4)
Wave3	-0.126***	-0.132***	-0.0531***	-0.0492***	0.0526***	0.0990***
	(-7.7)	(-2.6)	(-12.4)	(-4.4)	(3.8)	(2.6)
Wave 4	-0.140***	-0.154**	-0.0303***	-0.0298**	0.0526***	0.113**
	(-8.1)	(-2.3)	(-6.8)	(-2.0)	(3.7)	(2.3)
Constant	-3.635***	-3.901***	2.098***	2.427***	-2.838***	-2.040***
	(-12.7)	(-5.1)	(28.2)	(14.5)	(-11.9)	(-3.6)
N	21,034	21,034	19,566	19,566	20,761	20,761
R-sq (%)	6.0%	2.5%	7.4%	3.7%	8.0%	1.8%

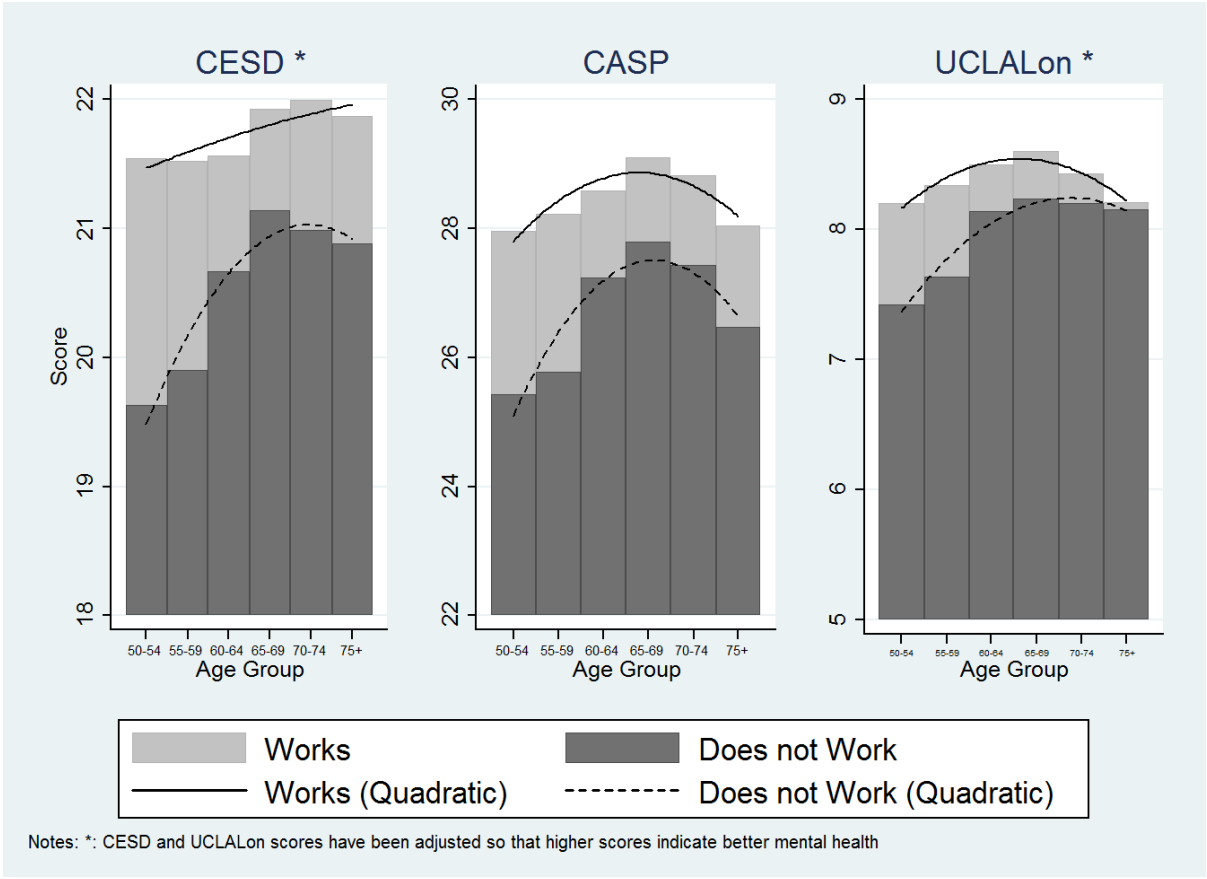
Notes: For all dependent variables, higher values indicate better mental health
t statistics in parentheses: * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$

Table 7
Mental Health Regression Estimates for "*DaysWork*" and "DaysVol" Specification

	(1)	(2)	(3)	(4)	(5)	(6)
Estimator	**OLS**	**FE**	**OLS**	**FE**	**OLS**	**FE**
	-ln(CESD)	*-ln(CESD)*	*ln(CASP)*	*ln(CASP)*	*-ln(UCLALon)*	*-ln(UCLALon)*
DaysWork	0.0479***	0.00845*	0.0135***	0.00125	0.0214***	0.000330
	(15.0)	(1.8)	(16.4)	(1.3)	(8.1)	(0.10)
DaysVol	0.0305***	0.0117**	0.00974***	0.00287**	0.0221***	0.00459
	(6.7)	(2.3)	(8.1)	(2.5)	(5.8)	(1.2)
MarCoh	0.220***	0.355***	0.0421***	-0.00351	0.366***	0.371***
	(16.1)	(8.2)	(11.8)	(-0.4)	(32.2)	(11.9)
Age	0.0707***	0.0782***	0.0348***	0.0304***	0.0447***	0.0408***
	(8.1)	(4.4)	(15.1)	(7.8)	(6.1)	(3.1)
Age^2	-0.000461***	-0.000542***	-0.000243***	-0.000234***	-0.000280***	-0.000356***
	(-7.3)	(-5.0)	(-14.6)	(-10.0)	(-5.3)	(-4.5)
Male	0.165***	--	-0.0208***	--	0.0151	--
	(13.3)		(-6.4)		(1.5)	
School	0.0162***	--	0.00682***	--	0.0164***	--
	(7.5)		(12.1)		(9.0)	
PoorHealth	-0.273***	--	-0.0698***	--	-0.123***	--
	(-11.0)		(-10.7)		(-5.9)	
PoorFam	-0.0902***	--	-0.0337***	--	-0.0842***	--
	(-5.8)		(-8.3)		(-6.5)	
MotherNoWork	0.0353***	--	0.0177***	--	0.0460***	--
	(2.7)		(5.1)		(4.2)	
FatherNoWork	0.0631***	--	0.00457	--	-0.0328	--
	(2.6)		(0.7)		(-1.6)	
Wave2	0.0234	0.0131	-0.0396***	-0.0374***	-0.0181	0.000883
	(1.4)	(0.5)	(-9.3)	(-7.0)	(-1.3)	(0.05)
Wave3	-0.123***	-0.135***	-0.0517***	-0.0493***	0.0509***	0.0907**
	(-7.1)	(-2.6)	(-11.6)	(-4.2)	(3.6)	(2.3)
Wave 4	-0.144***	-0.162**	-0.0293***	-0.0289*	0.0501***	0.102**
	(-8.1)	(-2.4)	(-6.3)	(-1.9)	(3.4)	(2.0)
Constant	-4.070***	-3.965***	2.012***	2.385***	-3.008***	-2.194***
	(-13.6)	(-5.0)	(25.7)	(13.5)	(-12.0)	(-3.7)
N	19,518	19,518	18,111	18,111	19,253	19,253
R-sq(%)	6.3%	2.4%	6.7%	3.8%	7.6%	1.8%

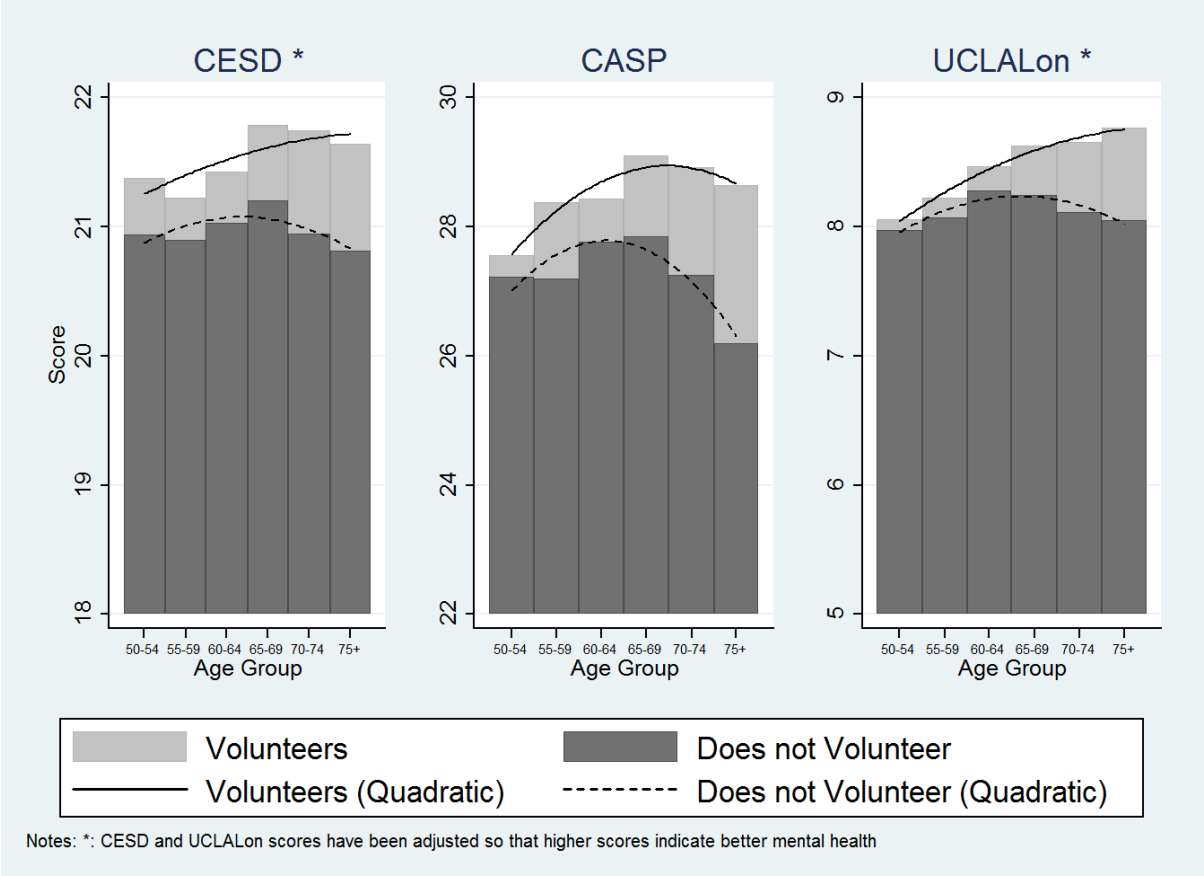
Notes: For all dependent variables, higher values indicate better mental health
t statistics in parentheses: * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$

Figure 1
Mean *CESD*, *CASP* and *UCLALon* Score
by Age Group and Employment Status



Notes: *: CESD and UCLALon scores have been adjusted so that higher scores indicate better mental health

Figure 2
Mean *CESD*, *CASP* and *UCLALon* Score
by Age Group and Volunteering Status



Notes: *: CESD and UCLALon scores have been adjusted so that higher scores indicate better mental health

Appendix Table A1
Measures of Mental Health in TILDA

Measure	Item	Frequency
CES-D 8	I felt depressed I felt that everything I did was an effort My sleep was restless I was happy I felt lonely I enjoyed life I felt sad I could not get "going"	Rarely or none of the time (less than 1 day) Some or a little of the time (1-2 days) Occasionally or a moderate amount of time (3-4 days) All of the time (5-7 days) Don't know Refused
CASP-12	*Control:* My age prevents me from doing the things I'd like to do I feel what happens to me is out of my control I feel free to plan for the future I feel left out of things *Autonomy:* I Feel I can please myself in what I can do My health stops me from doing the things I want to do Shortage of money stops me from doing the things I want to do *Pleasure:* I look forward to each day I feel my life has a meaning I enjoy being in the company of others *Self realisation:* I feel satisfied with the way my life has turned out I feel life is full of opportunities	Often Sometimes Rarely Never
UCLA Loneliness	How often do you feel a lack of companionship? How often do you feel left out? How often do you feel isolated from others? How often do you feel lonely? How often do you feel in tune with the people around you?	Often Some of the time Hardly ever or never